From: Commanding Officer, NR NRL S&T Det 510 Houston, TX
Subj: FY-01 SECOND QUARTER REPORT

SUMMARY SECTION

- TEDS to JMCIS Project: Wrote software to extract merchant ship position reports from TEDS and send them to a JMCIS terminal, permitting scientists to study the patterns of weather observations and identify inconsistencies in position reports. Also wrote software linked to the JMCIS API which simulated own ship's movement, permitting others to test and develop "Now Casting" weather software.
- Synthesis and Characterization of an Alumina / Carbon Nanotube Composite by Extrusion: Began preliminary lab work on Alumina/Nanotube composites including evaluation of binder materials, characterization of carbon fibers, and some extrusion experiments.
- Research Psychologist Web Site: This web site provides an essential tool for information exchange between active duty research psychologists working on ONR sponsored projects and other DOD funded research. LCDR York continued her support and maintenance of the web site for this important initiative.

PROJECT SECTION

Project Title: TEDS to JMCIS

Project Impact Summary: Authored software to extract merchant ship position reports from the Tactical Environmental Database System (TEDS) and send them to NRL Monterey's local JMCIS terminal, permitting scientists to study the patterns of weather observations and identify inconsistencies in position reports. Also wrote software linked to the JMCIS Application Programming Interface which simulated own ship's movement, permitting others to test and develop "Now Casting" weather software.

Supported Focus Area: NRL

In-Depth Impact:

- Provides quick visualization of the TEDS surface ship database population, distribution and reporting frequency.
- Allows scientists to play back GEO-SIT "movies" of surface ship position reports, showing where each surface synoptic observation is taken. This allows comparison of the relative reporting density in various areas of the ocean.
- JMCIS automatically compares new position reports to previous reports for the same ship and identifies any inconsistencies as "ambiguities". During a three-day trial run the software was detecting position anomalies in about 2% of the reports. Many seemed to be data entry errors at the ship end (ie north instead of south latitude and missing or transposed digits).
- There is the potential application of exporting these contact reports from the local JMCIS terminal to a fleet or battlegroup Force Over-the horizon Track Coordinator (FOTC) for inclusion in a fleet or battlegroup common operational picture.
- The own ship's movement simulator program provides a feed similar to shipboard GPS systems, continuously updating own ship's position in JMCIS. This will permit testing of software which needs to query JMCIS to obtain a real-time position, such as software proposed for the "Now Casting" weather forecasting program.

Execution: LCDR Kottke spent a 12 day AT period on-site at NRL Monterey, as a follow-on to preliminary work that was done last quarter as IDTT & incremental drills. All software was written under UNIX in the standard C programming language, with comprehensive documentation.

Customer: Larry Phegely, NRL Monterey, phegley@nrlmry.navy.mil, (831) 656-4752.

Reserve Project Team: LCDR Richard Kottke, NRL S&T 510.

Plans for Future Support: The TEDS 2 JMCIS project is complete, however LCDR Kottke laid the groundwork for future support of NRL Monterrey.

Project Title: Synthesis and Characterization of an Alumina / Carbon Nanotube Composite by Extrusion

Project Impact Summary: Began preliminary work on Alumina/Nanotube composites including evaluation of binder materials, characterization of carbon fibers, and some extrusion experiments.

Supported Focus Area: NRL

Execution:

- Characterized Vapor Grown Carbon Fibers (VGCFs) for eventual use in extruded alumina composites using Scanning Electron Microscopy (SEM) and Thermo-Gravimetric Analysis (TGA).
- Characterized candidate binders using TGA.
- Evaluated Hydroxypropylmethyl Cellulose (HPMC) and water as an alternative binder system for the composite.
- Conducted initial extrusion tests on alumina with a polyethylene wax binder.
- 38 man-hours of work this quarter.

Customer: Dr. M. A. Imam, NRL Code 6320, imam@anvil.nrl.navy.mil, (202) 767-2185.

Reserve Project Team: LT Yowell, NRL S&T 510.

Plans for Future Support: LT Yowell will continue this project as defined in his research proposal.

Project Title: Research Psychologist Web Site

Project Impact Summary: Provides an essential tool for information exchange between active duty research psychologists working on ONR sponsored projects and other DOD funded research.

Supported Focus Area: ONRHQ

Execution: LCDR York freed up an active duty psychologist, who had been maintaining the site, to return to full-time research. She spent 24 man-hours as incremental drills on web site maintenance and development this quarter. The work is being done remotely from Conroe, TX.

Customer: CDR Stephen Ahlers, ONR Medical S&T (code 341), ahlerss@onr.navy.mil, (703) 696-0369.

Reserve Project Team: LCDR Mary York, NRL S&T 510.

Plans for Future Support: LCDR York will continue to provide web site support and maintenance as needed.

S. J. Pursley
Commanding Officer